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## Portable Platforms for Setting Rocket Nets in Open-water Areas

Rocket-netting of aquatic birds is generally done from permanent sites that are free of vegetation and debris to allow visibility and unobstructed projection of nets; easy and expedient to access for baiting and removal of trapped birds; and located on land—but usually near water—to allow bait, nets, projectiles, electrical wiring and trapped birds to remain dry. Construction and maintenance of permanent sites is time-consuming and costly. Budget limitations, site-specific limitations (e.g., fluctuating water levels), or reluctance of target species to approach shore may make construction of permanent trapping sites infeasible. Consequently, we developed a technique for setting rocket nets on portable platforms to capture waterfowl in open-water habitats.

### Platforms Constructed From Industrial-grade Plywood

We constructed platforms from sheets (3/8 inches  $\times$  4 feet  $\times$  8 feet; 1 cm  $\times$  1.2 m  $\times$  2.4 m) of untreated industrial-grade plywood (Figure). Each plywood sheet was cut twice lengthwise into three platforms (16 inches  $\times$  8 feet;

0.4  $\times$  2.4 m). We camouflaged upper and edge surfaces of platforms by smearing them with a light coat of mud. Platforms were supported either by standard cinder blocks (8  $\times$  8  $\times$  16 inches; 20.3  $\times$  20.3  $\times$  40.6 cm) or by wall studs (2  $\times$  4 inches; 5.1  $\times$  10.2 cm) cut to 15-inch (38-cm) lengths. In deep water (3–14 inches), a cinder block was placed in the middle of each supporting platform, with each platform sharing a block with the next platform in line. In shallow water (1–3 inches), wall studs were placed at four equidistant points beneath each platform. We generally used nine platforms to support each net; however, the exact number was dependent on the way nets were gathered for firing. Approximate costs of platforms, including supports for a single net, are \$44 for deep water sets and \$51 for shallow water sets.

### Details on Rocket Net Setup

We used turkey nets (60  $\times$  40 feet; 17.4  $\times$  13.4-m) equipped with 2-foot (0.6-m) tapered fringes, with mesh sizes of 1–2 inches (3–5 cm). Projectiles consisted of rockets and W-115 charges

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(color-coded yellow; Winn-Star, Inc., Marion, Illinois). We followed U.S. Fish and Wildlife Service safety procedures for transport and use of rocket-net charges. Nets were equipped with four rockets each, and were anchored with five 1.5-foot (0.5-m) lines. Each anchor line was tied to two 2-inch (5-cm) wide rubber bands made from automotive tire inner tube to reduce backlash. We used 18-inch (46-cm) long stakes made from 0.5-inch (1.27-cm) diameter rolled steel to anchor rubber bands.

We wired charges in series using 16–20 gauge solid copper thermostat (waterproof) wire and detonated them with 650-A 12-V automotive batteries by means of remote-control units. To make rockets as inconspicuous as possible, we usually placed rockets on mounds constructed of mud and vegetation located 1.5–2 feet (0.5–0.8 m) in front of nets, and securely staked electrical wiring below the water surface. On two occasions, we placed rockets behind nets in launchers. We angled end rockets 30° laterally to facilitate net extension.

We placed two nets close together (within 10 feet) and detonated them simultaneously (on a single circuit) on eight occasions; we set single nets on two occasions. We camouflaged platforms, nets, and rockets with vegetation. We heavily baited an area extending from 1 m directly in front of nets to attract birds to the site, and progressively decreased the size of the baited area over time (2–8 days) to concentrate birds close to the net. We used unmilled domestic rice (*Oryza sativa*) as the primary bait, but also used smaller amounts of buckwheat (*Fagopyrum esculentum*), white millet (*Pennisetum glaucum*), dove proso (*Panicum miliaceum*) and brown-top millet (*Panicum ramosum*).

## Technique Successful for Waterfowl in Southwestern Louisiana

We used this technique in October 1991 and 1992 to capture waterfowl in southwestern Louisiana, primarily on Lacassine National Wildlife Refuge. We fired 18 nets from 10 detonations using the technique, and captured 952 northern pintails (*Anas acuta*), our target species. We incidentally captured 64 blue-winged teal (*Anas discors*), 50 fulvous whistling-ducks (*Dendrocygna bicolor*), 25 white-fronted geese (*Anser albifrons*), 11 green-winged teal (*Anas crecca*), 12 mottled ducks (*Anas fulvigula*) and two

northern shovelers (*Anas clypeata*). Numbers of waterfowl captured per successful detonation ( $n = 9$ ) ranged from 15 to 524, with an average of 124. One successful detonation of a double-net set resulted in poor net throws, and only 83 of an estimated 400 ducks within range of nets were captured. We believe that rockets, which were located in front of nets on this occasion, were placed too close to platforms causing dislodged platforms to become entangled in the extending net. In the single unsuccessful detonation, one double-net set fired only one end rocket from one of the nets, and no birds were captured. Failure of additional rockets to detonate was caused by a submerged, bare (noninsulated) electrical connection, which produced a short circuit.

## Low Incidence of Mortality and Escape

Twelve of 1,116 captured waterfowl (all pintails) died during capture. Eleven birds were drowned; one was found dead in the net, but exhibited no external signs of injury. The deaths by drowning occurred when two simultaneous firings of three nets (one double-set and one single-set) captured 594 ducks, mostly pintails. The drowned ducks became trapped between platforms and the portion of the net that was staked. We believe that such deaths could be avoided by staking nets in front of, rather than behind, platforms.

We found that escaping birds were a minor problem (29 of 1,116 captured ducks), even when water depths were sufficient for birds to swim out from under nets. We reduced potential escapes by approaching fired nets quickly and removing birds from the net perimeter first. We observed wet plumage on birds that spent longer than 15 minutes in nets and recommend holding birds until plumage dries before releasing. We also recommend that sufficient personnel be available (i.e., about one person per 20 birds captured) to remove birds from nets quickly so that capture myopathy is minimized.

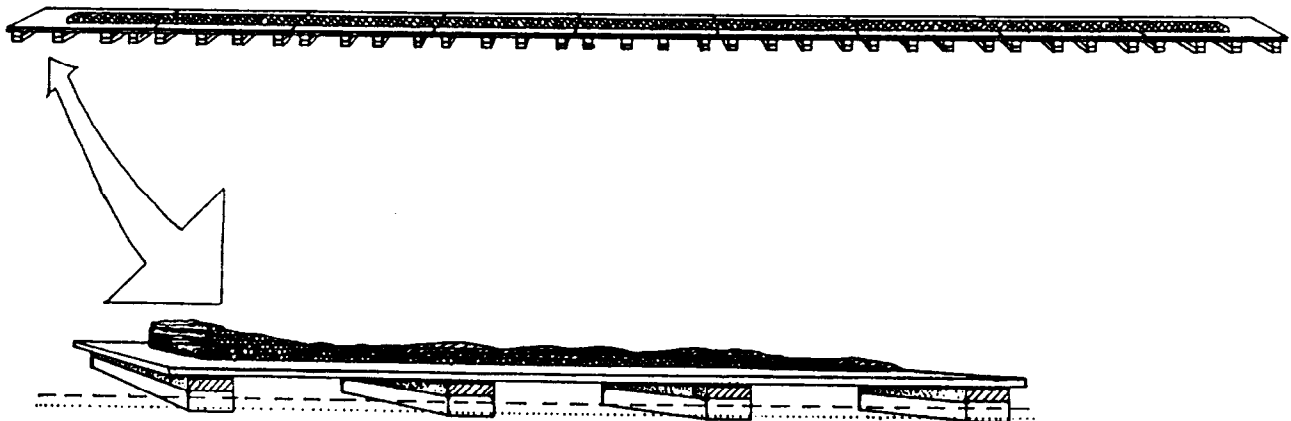
The major advantage of the technique is increased portability, allowing nets to be placed far from shore where some species, such as northern pintails, frequent. We found that the technique was effective in capturing waterfowl, and believe that it is applicable to other avian species using open-water habitats.

For further information contact

Robert R. Cox, Jr.  
Southern Science Center  
Lafayette, Louisiana 70506, and  
School of Forestry, Wildlife, and Fisheries  
Louisiana State University  
Baton Rouge, Louisiana 70803  
(504)642-5447

or

Alan D. Afton  
Louisiana Cooperative Fish and Wildlife  
Research Unit  
Louisiana State University  
Baton Rouge, Louisiana 70803  
(504)388-4212



**Figure.** Platforms (*top*) for a single rocket net (40 × 60 feet; 17.4 × 13.4 m) set in water 1 inch (2.5 cm) deep. Four sets of two wall studs (2 × 4 inches; 5.1 × 10.2 cm) are used to support each of nine platforms (3/8 inches × 4 feet × 8 feet; 1 cm × 1.2 m × 2.4 m). Wall studs can be nailed to platforms to expedite assembly. Inset (*bottom*) shows magnified view of left-most platform. Dashed line represents water surface and dotted line represents sediment surface.